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EDUCATION

Ph.D., 2010; **Sc. M.**, 2008, Brown University, Geological Sciences (advisor, J. Mustard)
M.Sc. by research, 2007, University of Oxford, Geography (Geomorphology; advisor, H. Viles)
M.Sc. with distinction, 2005, Univ. of Oxford, Environ. Change & Management (advisor, J. Boardman)
A.B. summa cum laude, 2004, Washington University in St. Louis (advisor, R. Arvidson)

Majors: Earth & Planetary Sciences, Environmental Studies; Minor: Mathematics

International Baccalaureate Diploma, Rickards High School, Tallahassee, Florida, 2000

Additional Training:

Nordic/NASA Summer School: Water, Ice and the Origin of Life in the Universe, Iceland, 2009

Vatican Observatory Summer School in Astronomy & Astrophysics, Castel Gandolfo, Italy, 2005

Rainforest to Reef Program: Marine Geology, Coastal Sedimentology, James Cook Univ., Australia, 2004

School for International Training, Development and Conservation Program, Panamá, Sept-Dec 2002

PROFESSIONAL EXPERIENCE

Professor of Planetary Science, *Division of Geological & Planetary Sciences, California Institute of Technology*,
Assistant Professor 2011-2017, Professor 2017-present; **Associate Director, Keck Institute for
Space Studies** 2018-present

Research Scientist, Jet Propulsion Laboratory, *California Institute of Technology*, 2011-2020

Lunar Trailblazer, Principal Investigator, 2019-present

MaMISS ExoMars, Collaborator, 2019-present

EMIT (Earth Surface Mineral Dust Source Investigation), Co-I, 2018-present

Mars 2020 mission, Mastcam-Z, Co-I; SHERLOC, Co-I, 2014-present

Mars Science Laboratory Participating Scientist, 2011-present

Dawn Science Team, Affiliate, 2015-2020

**Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) Science Team, Deputy
Principal Investigator**, 2017-present; **Co-Investigator**, 2013-present; **Collaborator** 2006-2013

European Union Marie Curie Fellow, *Institut d'Astrophysique Spatiale, Université Paris-Sud XI*, France,
2010-2011

Graduate Research Fellow, *Brown University*, 2006-2010

Postgraduate Researcher, *School of Geography & Environment, Environmental Change Institute, University of
Oxford*, 2004-2006.

Mars Exploration Rovers (MER) Athena Science Team, Science Collaborator, 2003-2004

Undergraduate Researcher, *Remote Sensing Laboratory, Washington University*, 2001-2004

Space Studies Board Intern, *National Research Council, National Academy of Sciences*, 2003

Student Science Consultant, *Interdisciplinary Enviro. Law Clinic, Washington Univ. School of Law*, 2003

Research Associate, *NASA Astrobiology Academy, Ames Research Center*, 2002

AWARDS AND FELLOWSHIPS

Urey Prize, Division for Planetary Sciences, American Astronomical Society (2017)

Macelwane Medal, American Geophysical Union (2015); AGU Fellow (2015)

Kavli Fellow, National Academy of Sciences (2015)

Mineralogical Society of America, Distinguished Lecturer (2014-2015)

National Geographic Emerging Explorer, 125th anniversary class (2013)

NASA Group Achievement Award, MSL Science Office Development and Operations Team (2013)

NASA Group Achievement Award, MSL ChemCam Instrument Development & Science Team (2013)

Zeldovich Medal, Comm. B (Planetary Science), Committee on Space Research (COSPAR) and Russian Academy of Sciences (2012)
Editors' Citation for Excellence in Refereeing for *Geophysical Research Letters* (2012)
Joukowsky Family Foundation Outstanding Dissertation Award, Brown University (2010)
Sherwood Chang-Eliot Kalmbach Award for Excellence in Astrobiology Research, student speaker award at the Gordon Origins of Life conference (2010)
Best student oral presentation, runner-up, International Clay Conference, Italy (2009)
Pellas-Ryder Award, best student-led, peer-reviewed planetary sciences paper, Geological Society of America and Meteoritical Society (2009)
Best Student Paper Award, Planetary Sciences Section, American Geophys. Union Fall Meeting (2008)
NASA Group Achievement Award, Mars Exploration Rover Science Operations Team (2005)
National Science Foundation Graduate Research Fellowship (2004-2009)
Rhodes Scholar (Missouri and Keble/Hertford, 2004)
Morris K. Udall Scholar in Environmental Studies (2002, 2003)
Barry M. Goldwater Scholar in Science, Mathematics, and Engineering (2002)

TEACHING EXPERIENCE

Ge151, Caltech. Fundamentals of Planetary Surfaces, Fall 2013-2020
Ge157c, Caltech. Remote Sensing for Environmental & Geological Applications, Spring 2013-2019
Ge194, Caltech. Special Topics in Planetary Science:
Current Issues in Understanding Reservoirs of Water on Mars, winter 2012
Isotopic Tracers of Mars Atmosphere-Surface Interactions, spring 2015
Scientific Issues in Mars Rover Landing Site Selection, winter 2016 and spring 2016 (led and co-taught as a multi-institutional seminar with Cornell, Purdue, U Copenhagen, Arizona State, Western Washington Univ., SUNY-Stony Brook) ([weblink](#))
Lecturer, The 1st International Winter School for Aquaplanetology, Koyasan University, Japan, February 28 - March 3, 2019
Lecturer, Workshop in Geology and Geophysics of the Solar System, Petnica Science Center, Petnica, Serbia, June 23rd-July 1st 2018
Nordic Network of Astrobiology Lecturer, Impacts and their Role in the Evolution of Life, Saaremaa, Estonia, 25 July - 3 August 2017
NASA Astrobiology Institute Lecturer, International Summer School of Astrobiology 2011: Mars Exploration: Unveiling a Habitable Planet, Santander, Spain, June 27-July 1, 2011.
Brown University Sherdian Center Certificate IV: Teaching Consultant Program, Teaching Consultant 2009-2010; **Certificate I: Introduction to Reflective Teaching Practice**, five course seminar, May 2007
Teaching Assistant, GE133, Remote Sensing of the Environment, Brown University, 2010.
Teaching assistant, geosciences undergraduate spring break field trip, Brown University 2008
Tutor for Remote Sensing-GIS, Oxford University Hilary and Trinity terms 2005, Michaelmas term 2006. Hired by colleges to teach seminar courses in remote sensing (term-long and revision) for first-year Geography students (Mansfield, Worcester, St. Hilda's, Christ Church, Merton, Wadham, St. Edmond's Hall Colleges)
Teaching Assistant, EPSc 407 Remote Sensing, Washington University, 2003
Honorable Mention, Best Teaching Assistant, Earth & Planetary Sciences Dept., May 2003
Academic Tutor, Earth & Planetary Sci. Courses, Washington Univ., 2001-2002

ADVISING

Ph.D. advisor for

Brandon Rasmussen (Caltech 2025-anticipated)
Sergio Parra (Caltech 2024-anticipated; co-advised with Victoria Orphan)
Eva Scheller (Caltech, 2022-anticipated; co-advised with John Grotzinger)
Nathan Stein (Caltech 2020; co-advised with John Grotzinger)
Ellen Leask (Caltech, 2020)
Nancy Thomas (Caltech, 2019)

Daven Quinn (Caltech, 2018; co-advised with Jason Saleeby and John Grotzinger)
Jennifer Buz (Caltech, 2018; co-advised with Joe Kirschvink)
Lu Pan (Planetary Sciences, Caltech, 2017)
Mathieu Lapotre (Geology, Caltech, 2017; co-advised with Mike Lamb)

Advisor for projects with Jessica Watkins (UCLA, 2015), Peter Buhler (Caltech, 2018), Dana Anderson (Caltech, 2020), Peter Martin (Caltech, 2020), Cecilia Sanders (Caltech, 2021-anticipated), Kevin Roback (Caltech, 2021-anticipated)

Ph.D. Thesis Advisory/Examination Committee Member for Kathryn Stack (Caltech, 2014), Kirsten Siebach (Caltech, 2016), Joe O'Rourke (Caltech, 2016), Michael Wong (Caltech, 2018), Ian Wong (Caltech, 2018), Dana Anderson (Caltech-2019), Samantha Trumbo (Caltech 2020-anticipated)

Ph.D. Examination Committee Member: Renyu Hu (MIT, 2013), Steven Chemtob (Caltech, 2012), Cedric Pilorget (IAS-Orsay, 2012), Alejandro Soto (Caltech, 2011), Congcong Che (SUNY, 2011)

Postdoctoral advisor for

Valerie Fox (Washington University in St. Louis, 2017; now postdoc University of Minnesota)
William Rapin (Université de Toulouse, 2016; now CNRS research scientist, U. Paris)
Elena Amador (University of Washington, 2017; now science systems engineer at JPL)
Rebecca Greenberger (Brown Univ., 2015; now research scientist at Caltech)
Abigail Fraeman (Washington University, 2014; now research scientist at JPL)
Cedric Pilorget (IAS-Orsay, 2012; now research faculty at IAS-Orsay)
Christopher Edwards (Arizona State, 2012; now assistant professor at Northern Arizona University)

Undergraduate advisor for

Daniel Lo (Planetary Science '14; now graduate student at University of Arizona)
Valerie Pietrasz (Planetary Science, '16)
Tyler Perez (Planetary Science, '18)
Elise Cutts (Geology, '19)

Lunar Trailblazer Student Collaboration advisor (PCC student Caltech internship)

Hongyu Cui ('19/20), Emily Felder ('19/20), Winnie Jeng ('19/20), Liberty Locsin ('19/20)

SURF/SIP/high school summer student advisor for

Marcos Perez (Caltech '23)
Lauren Suezaki (Caltech '20)
Elise Cutts (Caltech '19; now graduate student, Harvard, geobiology)
Caue Borlina (U. Michigan '16; now graduate student at MIT, planetary sciences)
Cecilia Sanders (Harvard '16; now graduate student at Caltech, planetary science)
Jade Yang (Caltech '15)
Eyjolfur Gundmundsson (U. Reykjavik '13; now graduate student at U Chicago, medical physics)
Bryne Hadnott (WUSTL '13; now research scientist BlackSky imaging)
David Oh Smith (Troy High School, '13)

PROFESSIONAL SERVICE

Steering Committee Member; Vice-Chair, Mars Panel, Planetary Science Decadal Survey, National Academy of Sciences (July 2020-)
Mars Architecture Working Group (2019-present)
Board of Directors, The Planetary Society (2018- present); President (2020-present)
Editor for Planetary Science, *AGU Advances* journal (2019-present)
National Academy of Sciences, Committee on Astrobiology and Planetary Sciences (2016-present)
PDS Reviewer, Dawn VIR dataset (2017-2020)
Mars 2020 Project Landing Site Working Group (2016-2019)
iMOST Report Section Lead. "The Potential Science and Engineering Value of Samples Delivered to Earth by Mars Sample Return", Report of the International MSR Objectives and Samples Team (iMOST), Beaty et al., 2018 (2017-2018).

Co-Chair and Organizer, Working Group on Rock-Hosted Life (2016-2018)
 NASA Europa Lander Science Definition Team (2016-2017)
 Organizing Committee, National Academy of Sciences, Arab-American Frontiers of Science, Engineering and Medicine symposium (2016)
 MEPAG Next Orbiter Science Analysis Group (May 2015-September 2015)
 Convener, Eighth International Conference on Mars, July 14-18, 2014, Pasadena, California.
 Scientific Program Committee, Planetary Systems: A Synergistic View, Rencontres du Vietnam, Jan-July 2015
 Independent Assessment Team, Mars 2020 Science Definition Team, March-April 2013
 Integration Panel, Concepts & Approaches for Mars Exploration LPI Workshop, June 12-14, 2012, Houston, TX
 Scientific Organizing Committee, Third International Conference on Early Mars, May 2012
 Session convener, AGU, 2011, 2012; IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, 2013; Clay Minerals Society Annual Meeting, 2014; Goldschmidt 2016
 Reviewer for *Science*, *Nature*, *Geology*, *Earth & Planetary Science Letters*, *Journal of Geophysical Research*, *Icarus*, *Planetary & Space Science*, *Eos*; Associate editor, *JGR CRISM* special issue (2012); Associate editor, *JGR MSL* special issue (2017)
 Review panel member and External grant reviewer for diverse NASA programs
 Rhodes Scholar Selection Committee, District XIII (2009-2012; 2014-2016), District XVI (2017- ; Secretary, 2018-)

CALTECH & JPL SERVICE

Advisory Committee on Student Admissions and Recruitment (2020-present)
 Provost Committee on International Collaboration (2020-present)
 Planetary Science Option representative (2017-present)
 Faculty advisor, Caltech Student SmallSats Group (2017-present)
 Keck Institute for Space Studies Steering Committee (2012-present); Associate Director (2017-present)
 Caltech-GPS GIS Committee (2012-present)
 JPL Hiring Committee, Planetary Science: Mars (2013-2015); Small Bodies (2019-2020)
 Caltech Planetary Science Faculty Search Committee chair (2018-2019)
 Caltech Library Committee (2012-2018)
 Core Committee, Caltech-GPS (2013)
 University Resources Committee (sets annual operating budget), graduate student representative, Brown University (2008-2010)
 Rhodes/Marshall Scholarship Nominating Committee, Brown University (2006-2009)
 Geoclub (geoscience graduate student group), Treasurer (2007); Rep. to Grad Student Council (2008)
 Rhodes Scholar Southern Africa Forum, executive committee member (2005-6)
 Committee on Environmental Quality, Washington University, student rep. and co-chair (2002-4)
 Student Union, Washington University, Senator, Academic Affairs committee co-chair (2001-4)

SELECTED OUTREACH

Interviews for NOVA's *The Planets*, 2019
 National Geographic Children's Books, ISBN: 978-1426327988, *Dr. E's Super-Stellar Solar System*. By Bethany Ehlmann and Jennifer Swanson, 2018
The Guardian Op-Ed (invited) on Curiosity's Exploration, 2013
 IAG Planetary Geomorphology Image of the Month contributor (10/2008, 5/2010)
 Curriculum preparation for the National Science Teachers Association. "What we can learn at different spectral and spatial resolutions: an example from Mars" (2009)
 Mentor for JHU-APL's CRISM Mars Exploration Student Data Team, Kickapoo H.S., Missouri (2007-2008)

Docent for RI Museum of Natural History “Mars 3-D” exhibit (2007)
Bi-semesterly Earth science lessons for 2nd & 4th grades at Vartan Gregorian Elementary School (2006-2010)

RESEARCH GRANTS (external)

- PI, NASA Solar System Workings**, Tracing Serpentinization Across the Solar System, 2020-2023, \$596k
- PI (J. Dickson, Science PI), NASA Mars Data Analysis**, Global Mapping at High Resolution of Glacial Units on Mars: Calculating Constraints on the Long-Term Evolution of the Martian Climate, 2020-2023, \$477k
- PI (E. Amador, Science PI), NASA Mars Data Analysis**, A Quantitative Approach to Understanding the Distribution and Diversity of Key Water-Formed Minerals on Mars, 2019-2022, \$188k
- Co-I, NASA Solar System Workings (T. McCollom, PI)**, Investigation of Jarosite and Alunite in Jurassic Snadstones as Analogs for Layered Sulfate-bearing Deposits on Mars, 2019-2022, \$50k
- Co-I, NASA ICEE-2 (S. Murchie, PI)**, Europa Lander Stereo Spectral Imaging System, \$36k
- Co-I, NASA DALI 2018 (A. Fraeman, PI)**, An Ultra Compact Imaging Spectrometer for the Moon, 2019-2022, \$103k
- Co-I, European Union (C. Garcia-Panda, PI)**, FRAGMENT: Mineral fragmentation and dust emission, 2018-2023, \$60k
- PI (J. Dickson, Science PI), NASA Planetary Data Analysis Research and Tools**, A Global CTX Mosaic of Mars, 2019-2022, \$438k
- Co-I, NASA Solar System Workings (W. Calvin, PI)**, Mineralogy of Hawaiian Shield Volcano Drill Core: Implications for Surface and Subsurface Aqueous History on Mars, 2018-2021, \$306k
- PI, NASA Emerging Worlds**, Isolating and Understanding Spectrally Active Constituents in Carbonaceous Chondrites: Linking Meteorite to Telescopic and Spacecraft Data, 2018-2021, \$398k
- Co-I, NASA Habitable Worlds (R. Hu, PI)**, Constraining Early Mars’s Atmosphere and Habitability with Isotopic Measurements, 2017-2020, \$33k
- PI, NASA Mars Data Analysis**, The Plumbing of Martian Lakes, 2017-2020, \$440k
- Co-I, NASA Solar System Workings (L. Rampe, PI)**, Understanding Diagenetic Processes on the Martian Surface through Laboratory Studies of Partially Chloritized Smectite, 2016-2018
- PI, NASA/JPL**, MRO CRISM Extended Mission Investigation Support, 2016-2019, \$63k.
- PI, NASA MSL Participating Scientist Program** Recognizing Aqueous Alteration While Roving and Disentangling Diagenesis, 2016-2020, \$600k
- PI, NASA Solar Systems Working**, Identifying and Quantifying Phyllosilicate-Bearing Materials on Solar System Bodies, 2015-2018, \$398k
- Co-I, NASA Mars 2020 Investigations (J. Bell, PI)**, Mastcam-Z: A Geologic, Stereoscopic, and Multispectral Investigation for the NASA Mars 2020 Rover Mission, 2015-2020, \$198k
- Co-I, NASA Mars 2020 Investigations (L. Beegle, PI)**, SHERLOC: Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals for Mars 2020, 2015-2020
- Co-I, NASA Exbiology (J. Kirschvink, PI)**, Application of New Paleomagnetic and Rock Magnetism Techniques to Test the Origin of Magnetites in ALH84001 Carbonates, 2015-2018
- PI (Science PI, postdoc C. Pilorget,)**, **NASA Mars Fundamental Research Program**, Long-term Stability of the Polar Reservoirs of CO₂ Ice on Mars, 2014-2017, \$170k
- Co-I, NASA Mars Fundamental Research Program (T. McCollom, PI)**, Methods for Remote Detection of Mineral Composition for the Alunite-Jarosite Group, 2014-2017, \$72k
- PI, National Geographic Society**, Emerging Explorers grant, 2013-2017, \$10k
- Co-I, NSF Astronomy and Astrophysics Research Grants (M. Brown, PI)**, The Nature of Europa’s Surface and Ocean from New Infrared Spectroscopy, 2013-2017
- Co-PI, Caltech-JPL PDF/RTD program**, Surface-Based Hyperspectral Imaging for Advanced Planetary and Terrestrial Applications, 2013-2015, \$299k
- PI, NASA Mars Fundamental Research Program, Planetary Major Equipment** A Hyperspectral VNIR camera for Microscopic- and Outcrop-Scale Studies, 2013-2014, \$200k
- PI, JPL RFP Mars Future Landing Sites**. Jezero Crater Basin Stratigraphy, Sedimentology, and Mineralogy. 2012-2013, \$35k
- PI, JPL RFP Mars Future Landing Sites**. Land-on science at the Nili Fossae Carbonate Plains: Aqueous Alteration of Ultramafic Rocks and Clay-Carbonate Stratigraphy, 2012-2013, \$35k.

- PI, NASA Mars Data Analysis.** Phyllosilicates of the Northern Lowlands: Implications for Aqueous Alteration on Mars, 2012-2016, \$310k
- PI, NASA MSL Participating Scientist Program** Recognizing Evidence of Aqueous Alteration While Roving: Linking hydrated mineral detections from orbit to MSL remote and in-situ measurements, 2012-2016, \$598k
- PI, NASA Mars Fundamental Research Program** “Aqueous Alteration of Ultramafic Rocks in Oman as an Analog for Understanding Martian Carbonates: a Remote, Field and Laboratory Investigation.” 2012-2016, \$252k

PEER-REVIEWED PUBLICATIONS & PROCEEDINGS

(student under direct supervision; *student-led collaboration*; *=ugrad or #=lab member under supervision)

144. Kurokawa, H., **Ehlmann, B. L.**, De Sanctis, M. C., Lapôtre, M. G. A., Usui, T., Stein, N. T., et al. (2020). A probabilistic approach to determination of Ceres' average surface composition from dawn visible-infrared mapping Spectrometer and Gamma Ray and Neutron Detector data. *Journal of Geophysical Research: Planets*, 125, e2020JE006606. doi:10.1029/2020JE006606
143. Green, R. et al. (incl. **BL Ehlmann**) (2020). The Earth Surface Mineral Dust Source Investigation: An Earth Science Imaging Spectroscopy Mission. In 2020 IEEE Aerospace Conference (pp. 1–15). doi: 10.1109/AERO47225.2020.9172731
142. Scheller, E. L., & **Ehlmann, B. L.** (2020). Composition, stratigraphy, and geological history of the Noachian Basement surrounding the Isidis impact basin. *Journal of Geophysical Research: Planets*, 125, e2019JE006190. doi: 10.1029/2019JE006190
141. Greenberger, RN#, **Ehlmann, BL**, Osinski, GR, Tornabene, LL, & Green, RO (2020). Compositional Heterogeneity of Impact Melt Rocks at the Houghton Impact Structure, Canada: Implications for Planetary Processes and Remote Sensing. *Journal of Geophysical Research: Planets*, 125, e2019JE006218. doi:10.1029/2019JE006218
140. Watkins, J.A., **BL Ehlmann**, A Yin (2020) Spatiotemporal evolution, mineralogical composition, and transport mechanisms of long-runout landslides in Valles Marineris, Mars. *Icarus*, 350 . Art. No. 113836
139. Rasmussen, BP, WM Calvin, **BL Ehlmann**, TF Bristow, N Lautze, AA Fraeman, JW DesOrmeau (2020) Characterizing low-temperature aqueous alteration of Mars-analog basalts from Mauna Kea at multiple scales. *American Mineralogist*, 105 (9). pp. 1306-1316. ISSN 0003-004X.
138. Smith, IB et al. (incl **BL Ehlmann**) (2020) The Holy Grail: A road map for unlocking the climate record stored within Mars' polar layered deposits. *Planetary and Space Science*, 184 . 104841.
137. Stein, N.T., D. Quinn, J. Grotzinger, C. Fedo, **B.L. Ehlmann**, K. Stack Morgan, L. Edgar, A. Fraeman, R. Deen. Regional structural orientation of the Mt. Sharp group revealed by in-situ dip measurements and stratigraphic correlations on the Vera Rubin ridge, submitted to *JGR-Planets*, doi: 10.1029/2019je006298
136. Thomas, N., **B.L. Ehlmann**, W. Rapin, F. Rivera-Hernandez, N. Stein, J. Frydenvang, T. Gabriel, P-Y Meslin, S. Maurice, R. Wiens. Hydrogen Variability in the Murray Formation, Gale Crater, Mars, submitted to *JGR-Planets*, doi: 10.1029/2019je006289
135. Amador, ES# and **BL Ehlmann**, Early Mars, in *Planetary Astrobiology*, University of Arizona Press, 2020
134. Buhler, PB, A.P. Ingersoll, S. Piqueux, **B.L. Ehlmann**, P.O. Hayne. Co-Evolution of Mars' Atmosphere and Massive CO2 Ice Deposit. *Nature Astronomy*, 4(4). 364-371
133. Green, RO (incl. **BL Ehlmann**) et al. (2020) Earth Surface Mineral Dust Source Investigation: An Earth Science Imaging Spectroscopy Mission. *Proceedings IEEE Aerospace Conference*. 2020, pp. 1-15. ISBN 9781728127347.
132. Martin, PE, **BL Ehlmann**, NH Thomas, RC Wiens, JJR Hollis, LW Beegle, R Bhartia, SM Clegg, and DL Blaney, Studies of a Lacustrine-Volcanic Mars Analog Field Site with Mars-2020-like Instruments, *Earth & Space Science*
131. Murchie, SL, J-P Bibring, JL Bishop, J Carter, Y Langevin, F Poulet, JF Mustard, RE Arvidson, **BL Ehlmann**, KD Seelos, CE Viviano-Beck, L Riu. VSWIR spectral analyses of Mars from orbit using CRISM and OMEGA in *Remote Compositional Analysis*, ed. JL Bishop, JF Bell III, J Moersch, Cambridge University Press, doi: 10.1017/9781316888872.

130. Rossman, GR and **BL Ehlmann**, Electronic Spectra of Minerals in the Visible and Near-Infrared Regions, in *Remote Compositional Analysis*, ed. JL Bishop, JF Bell III, J Moersch, Cambridge University Press, doi: 10.1017/9781316888872.
129. Rapin, W.#, **B. L. Ehlmann**, G. Dromart, J. Schieber, N. Thomas, W.W. Fischer, V. Fox, N. Stein, M. Nachon, B. Clark, L. Kah, L. Thompson, H. A. Meyer, T.S.J. Gabriel, C. Hardgrove, N. Mangold, S. Clegg, R.C. Wiens, A. Vasavada. An interval of high salinity in ancient Gale crater lake, Mars. Submitted to *Nature Geoscience*, doi: 10.1038/s41561-019-0458-8
128. Thomas, N. H., **B. L. Ehlmann**, P.-Y. Meslin, W. Rapin, D. E. Anderson, F. Rivera-Hernández, O. Forni, S. Schröder, A. Cousin, N. Mangold, R. Gellert, O. Gasnault, and R. C. Wiens. N. H. Mars Science Laboratory Observations of Chloride Salts in Gale Crater, Mars. *Geophys. Res. Lett.*, doi: 10.1029/2019GL082764
127. Onstott, T.C., **B.L. Ehlmann**, H. Sapers, M. Coleman, M. Ivarsson, J.J. Marlow, A. Neubeck, P. Niles. Paleo-Rock-Hosted Life on Earth and the Search on Mars: a Review and Strategy for Exploration, submitted to *Astrobiology*, 19(10), doi:10.1089/ast.2018.1960
126. Quinn, DP, **BL Ehlmann**, A PCA-based framework for determining remotely-sensed geological surface orientations and their statistical quality, submitted to *Earth and Space Science*, 10.1029/2018EA000416, 2019.
125. Quinn, DP, **BL Ehlmann**, The deposition and alteration history of the northeast Syrtis Major layered sulfates, for *JGR-Planets*, submitted to *JGR-Planets*, 10.1029/2018JE005706, 2019.
124. Wong, I., M.E. Brown, J. Blacksberg, **B.L. Ehlmann**, A. Mahjoub. Hubble ultraviolet spectroscopy of Jupiter Trojans. *Astrophysical Journal*, 157(4), 10.3847/1538-3881/ab0e00.
123. Buz, J., **B.L. Ehlmann**, K. Kinch, M.B. Madsen, J.R. Johnson, M.S. Rice, J. Maki, J.F. Bell, Photometric characterization of Lucideon and Avian Technologies color standards including application for calibration of the Mastcam-Z instrument on the Mars 2020 rover, *Optical Engineering* 58(2), 027108 (2019), doi: 10.1117/1.OE.58.2.027108
122. Prettyman, TH, N Yamashita, E Ammannito, **BL Ehlmann**, HY McSween, DW Mittlefehldt, et al. Elemental composition and mineralogy of Vesta and Ceres: Distribution and origins of hydrogen-bearing species, *Icarus*, 318, 42-55, 2019
121. Yung, YL et al. (incl. **B. Ehlmann**) Methane on Mars and Habitability: Challenges and Responses. *Astrobiology*, 18 (10). pp. 1221-1242, 2018.
120. Lapotre, MGA, RC Ewing, CM Weitz, KW Lewis, MP Lamb, **BL Ehlmann**, DM Rubin. Morphologic Diversity of Martian Ripples: Implications for Large-Ripple Formation. *Geophysical Research Letters*, 45 (19). pp. 10229-10239.
119. Johnson, JR, Bell, JF III, Bender, S, Cloutis, E, **Ehlmann, B**, Fraeman, A, et al. Bagnold Dunes campaign phase 2: Visible/near-infrared reflectance spectroscopy of longitudinal ripple sands. *Geophysical Research Letters*, 45, 9480–9487. doi:10.1029/2018GL079025, 2018
118. Leask, EK, **Ehlmann, BL**, Dundar, MM, Murchie, SL, & Seelos, FP. Challenges in the search for perchlorate and other hydrated minerals with 2.1- μm absorptions on Mars. *Geophysical Research Letters*, 45, 12,180–12,189. doi:10.1029/2018GL080077, 2018
117. Thomas, NH, **Ehlmann, BL**, Anderson, DE, Clegg, SM, Forni, O, Schröder, S, et al. (2018). Characterization of hydrogen in basaltic materials with laser-induced breakdown spectroscopy (LIBS) for application to MSL ChemCam data. *JGR-Planets*, 123, 1996–2021. doi: 10.1029/2017JE005467, 2018
116. Rapin, W#, Chauviré, B, Gabriel, TSJ, McAdam, AC, **Ehlmann, BL**, Hardgrove, C, et al. In situ analysis of opal in Gale crater, Mars. *JGR-Planets*, 123, 1955–1972. doi: 10.1029/2017JE005483, 2018
115. Pan, L, **BL Ehlmann**. Aqueous processes from diverse hydrous minerals in the vicinity of Amazonian-aged Lyot crater. *JGR-Planets*, 123, 1618–1648. doi: 10.1029/2017JE005461, 2018
114. **Ehlmann, BL**, R Hodyss, TF Bristow, GR Rossman, E Ammannito, MC De Sanctis, CA Raymond. Ambient and cold-temperature infrared spectra of ammoniated phyllosilicates and carbonaceous chondrite meteorites relevant to Ceres and other solar system bodies, *Meteoritics and Planetary Sciences*, 53(9), 1884-1901, 2018
- 113 Poston, MJ, A Mahjoub, **BL Ehlmann**, J J Blacksberg, M Brown, RW Carlson, Eiler, KP Hand, R Hodyss, I Wong. The Colors of Irradiated Mixed Ices and Application to Kuiper Belt and Jupiter Trojan Small Bodies, *The Astrophysical Journal*, 856, 124, 2018

- 112 Carrozzo, FG, MC De Sanctis, A Raponi, E Ammannito, J Castillo-Rogez, **BL Ehlmann**, S Marchi, N Stein, et al. Nature, formation, and distribution of carbonates on Ceres, *Science Advances*, 4(3), e1701645, doi: 10.1126/sciadv.1701645, 2018
- 111 Stein, NT, **BL Ehlmann**, E Ammannito, E Palomba MC DeSanctis, R Jaumann, A Nathues, et al. Characteristics, Formation, and Evolution of Faculae (Bright Spots) on Ceres, *Icarus*, doi: 10.1016/j.icarus.2017.10.014, 2017
- 110 Palomba, E, A Longobardo, MC De Sanctis, N T Stein, **B Ehlmann**, A Galiano, A Raponi, et al. Compositional differences among Bright Spots on the Ceres surface, *Icarus*, 10.1016/j.icarus.2017.09.020, 2017
- 109 Gainey S R, Hausrath EM, Adcock CT, Tschauner OD, Hurowtiz JA, **Ehlmann BL**, Xiao Y, Bartlett CL. Clay mineral formation under oxidized conditions and implications for paleoenvironments and organic preservation on Mars. *Nature Communications*, 8, 1230, 2017
108. Bridges, NT and **BL Ehlmann**, The Mars Science Laboratory (MSL) Bagnold Dunes campaign, Phase I: Overview and introduction to the special issue, *JGR-Planets*, doi:10.1002/2017JE005401, 2018
107. Mahjoub, A, MJ Poston, J Blacksberg, JM Eiler, ME Brown, **BL Ehlmann**, R Hodyss, KP Hand, R Carlson, M Choukroun. Production of sulfur allotropes in electron irradiated Jupiter Trojan ice analogs, *Astrophysical Journal*, 846 148, doi:10.3847/1538-4357/aa85e0, 2017
106. Pan, L., **BL Ehlmann**, J Carter, C Ernst. The stratigraphy and history of Mars' northern lowlands through mineralogy of impact craters: A comprehensive survey. *JGR-Planets*, doi: 10.1002/2017JE005276, 2017.
- 105 Ehlmann, BL** et al. Chemistry, Mineralogy, and Grain Properties at Namib and High Dunes, Bagnold Dune Field, Gale Crater, Mars: A Synthesis of Curiosity Rover Observations, *JGR-Planets*, 122, doi:10.1002/2017JE005261, 2017.
104. Cousin, A et al. (incl **BL Ehlmann**), Geochemistry of the Bagnold Dune Field as observed by ChemCam, and comparison with other aeolian deposits at Gale crater, *JGR-Planets*, 122, doi:10.1002/2017JE005261, 2017.
103. Achilles, CN et al. (incl. **BL Ehlmann**), Mineralogy of an Active Eolian Sediment from the Namib Dune, Gale Crater, Mars, *JGR-Planets*, 122, doi:10.1002/2017JE005262, 2017.
102. Lapotre, M. G. A., **B. L. Ehlmann**, S. E. Minson, A Probabilistic Approach to Remote Compositional Analysis of Planetary Surfaces, *JGR-Planets*, 122, 983–1009, 10.1002/2016JE005248, 2017.
101. Lapotre, M. G. A., **B. L. Ehlmann**, S. E. Minson, R. E. Arvidson, F. Ayoub, A. A. Fraeman#, R. C. Ewing, and N. T. Bridges, Compositional Variations in Sands of the Bagnold Dunes at Gale Crater, Mars, from Visible-Shortwave Infrared Spectroscopy and Comparison to Ground-Truth from the Curiosity Rover, *JGR-Planets*, 122, doi:10.1002/2016JE005133, 2017.
100. Johnson, JR et al. (incl **BL Ehlmann**), Visible/near-infrared spectral diversity from in situ observations of the Bagnold Dune Field sands in Gale Crater, Mars, *JGR-Planets*, doi:10.1002/2016JE005187, 2017.
99. Buz, J., **Ehlmann, B.L.**, Pan, L., Grotzinger, J.P. Mineralogy and stratigraphy of the Gale crater rim, wall, and floor units, *JGR-Planets*, 122, 1090–1118, doi:10.1002/2016JE005163, 2017.
98. Anderson, DE, **BL Ehlmann**, O Forni, SM Clegg, A Cousin, NH Thomas, J Lasue, DM Delapp, RE McInroy, O Gasnault, MD Dyar, S Schröder, S Maurice, and RC Wiens. Characterization of Laser-Induced Breakdown Spectroscopy (LIBS) emission lines for the identification of chlorides, carbonates, and sulfates in salt/basalt mixtures for the application to MSL ChemCam data, *JGR-Planets*, 10.1002/2016JE005164, 2017
97. Anderson, RB, SM Clegg, J Frydenvang, RC Wiens, S McLennan, RV Morris, **B Ehlmann**, MD Dyar. Improved Accuracy in Quantitative Laser-Induced Breakdown Spectroscopy Using Sub-Model Partial Least Squares, submitted to *Spectrochimica Acta Part B: Atomic Spectroscopy*, 129, 49-57, 2017.
96. Wordworth, R, Kalugina, Y, Lokshatnov, S., Vigin, A., Head, J., **Ehlmann, B**, Sanders, C, Wang, H. Episodic methane greenhouse warming on Early Mars, *Geophysical Res. Letters*, doi: 10.1002/2016GL071766, 2017
95. Clegg, SM et al. (incl. **BL Ehlmann**), Recalibration of the Mars Science Laboratory ChemCam Instrument with an Expanded Geochemical Database, *Spectrochimica Acta B: Atomic Spectroscopy*, 10.1016/j.sab.2016.12.003, 2017
94. Prettyman, T et al. (incl. **B. Ehlmann**), Extensive water ice within Ceres' aqueously altered regolith, *Science*, doi: 10.1126/science.aah6765, 2017

93. Buhler, P. B., A.P. Ingersoll, **B.L. Ehlmann**, C.I. Fassett, and J. W. Head. How the Martian Residual South Polar Cap Develops Quasi-Circular and 1 Heart-Shaped Pits, Troughs, and Moats, *Icarus*, doi: 10.1016/j.icarus.2017.01.012, 2017
92. Wellington, DE, JF Bell III, JR Johnson, KM Kinch, MS Rice, AA Fraeman, C Hardgrove, A Godber, **BL Ehlmann**, and the MSL science team. Visible to near-Infrared MSL/Mastcam multispectral imaging results from select high-interest science targets within Gale Crater, Mars. *American Mineralogist*, 10.2138/am-2017-5760CCBY, 2017
91. Hadnott, BA*, **BL Ehlmann**, BL Jolliff. Mineralogy and chemistry of San Carlos high-alkali basalts: analyses of alteration with application for Mars exploration. *American Mineralogist*, doi: 10.2138/am-2017-5608, 2017
90. Steiner, MH, EM Hausrath, ME Elwood Madden, **BL Ehlmann**, AA Olsen. Dissolution of nontronite in low water activity brines and implications for the aqueous history of Mars, *Geochimica et Cosmochimica Acta*, 195 . pp. 259-276. ISSN 0016-7037.
89. **Ehlmann, BL** et al. (and 45 others) The Sustainability of Habitability on Terrestrial Planets: Insights, Questions, and Needed Measurements from Mars for Understanding the Evolution of Earth-like Worlds, *J. Geophys. Res.*, doi: 10.1002/2016JE005134, 2016
88. Fraeman, AA#, **B. L. Ehlmann**, R. E. Arvidson, C. S. Edwards, J. P. Grotzinger, R.E. Milliken, D. P. Quinn, M. S. Rice. The Stratigraphy and Evolution of Lower Mt. Sharp from Spectral, Morphological, and Thermophysical Orbital Datasets, *JGR-Planets*, doi: 10.1002/2016je005095, 2016
87. Ammannito, E.A., et a. (incl. **BL Ehlmann**) Distribution of phyllosilicates on the surface of Ceres, *Science*, 353, 10.1126/science.aaf4279, 2016
86. De Sanctis, M.C. et al. (incl. **BL Ehlmann**), Bright Carbonate deposits as evidence of aqueous alteration on (1) Ceres. *Nature*, 536, doi:10.1038/nature1829, 2016
85. Edwards, CS#. and **Ehlmann, BL**. Carbon sequestration on Mars: Reply. *Geology*, 44(6). e389, doi: 10.1130/G37984 Y.1, 2016
84. **Ehlmann, BL**, GA Swayze, RE Milliken, JJ Wray, JF Mustard, GN Breit, RN Clark, B Gondet, F Poulet, RO Rye, WM Calvin, WM Benzel, KD Seelos, J Carter, SL Murchie. Discovery of alunite in Cross Crater, Terra Sirenum, Mars: Evidence for precipitation from acidic, sulfurous groundwaters on the margin of a paleolake. *American Mineralogist*, doi: 10.2138/am-2016-5574, 2016
83. Dundar, M., **Ehlmann BL**. Rare jarosite detection in CRISM imagery by non-parametric Bayesian clustering. *IEEE Transactions, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, Los Angeles, CA, 21-24 Aug. 2016, 5p, doi: 10.1109/WHISPERS.2016.8071747
82. Greenberger, R.N.#, **Ehlmann, BL.**, Jewell, P.W., Birgenheier, L. P., Green, R.O. Detection of organic-rich oil shales of the Green River Formation, Utah, with ground-based imaging spectroscopy. *IEEE Transactions, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, Los Angeles, CA, 21-24 Aug. 2016, 5p, doi: 10.1109/WHISPERS.2016.8071807
81. Leask, EL, **Ehlmann, BL**. Identifying and quantifying mineral abundance through VSWIR microimaging spectroscopy: a comparison to XRD and SEM. *IEEE Transactions, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, Los Angeles, CA, 21-24 Aug. 2016, 5p, doi: 10.1109/WHISPERS.2016.8071774
80. Fraeman, AA#, **Ehlmann, BL**, Northwood-Smith, GWD*, Liu, Y, Wadhwa, M, Greenberger, RN#. Using VSWIR microimaging spectroscopy to explore the mineralogical diversity of HED meteorites. *IEEE Transactions, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, Los Angeles, CA, 21-24 Aug. 2016, 5p, doi: 10.1109/WHISPERS.2016.8071804
79. Wray, J. J., S. L. Murchie, J. L. Bishop, **B. L. Ehlmann**, R. E. Milliken, M. B. Wilhelm, K. D. Seelos, and M. Chojnacki (2016), Orbital evidence for more widespread carbonate-bearing rocks on Mars, *J. Geophys. Res. Planets*, 121, doi:10.1002/2015JE004972.
78. Turner, SMR, JC Bridges, S. Grebby, **BL Ehlmann**. Hydrothermal Activity Recorded in Post Noachian-aged Impact Craters on Mars, *JGR-Planets*, doi: 10.1002/2015JE004989, 2016
77. Maurice, S. and 48 others (incl. **B Ehlmann**). ChemCam Activities and Discoveries during the Nominal Mission of Mars Science Laboratory in Gale crater, Mars, submitted to *Journal of Analytical Atomic Spectroscopy*, 1,863-889, doi: 10.1039/C5JA00417A, 2016
76. Johnson, JR, Bell, JF III, Bender, S, Blaney, D, Cloutis, E, **Ehlmann, B**, Fraeman, A, Gasnault, O, Kinch, K, Le Mouélic, S, and others. Constraints on iron sulfate and iron oxide mineralogy from

- ChemCam visible/near-infrared reflectance spectroscopy of Mt. Sharp basal units, Gale Crater, Mars. *American Mineralogist*, 101, 1501–1514, 2016.
75. Mahjoub, A., MJ Poston, K Hand, M Brown, R Hodyss, J Blackberg, J Eiler, R Carlson, **BL Ehlmann**, M Choukroun. Electron Irradiation and Thermal Processing of Mixed-iced of Potential Relevance to Jupiter Trojans Asteroids. *The Astrophysical Journal*, 820:141, 2016.
 74. Murchie, SL et al. (and 16 others incl **BL Ehlmann**) Mars-Moons Reconnaissance and Landed Investigation (MERLIN). *IEEE Transactions, IEEE Aerospace Conference*, Big Sky, Montana, March 5-12, 2016
 73. Pilorget, C#, J Fernando, **BL Ehlmann**, F Schmidt, T Hiroi. Wavelength dependence of photometric properties in the VIS-NIR and link with the grains' physical and compositional properties, *Icarus*, 267, 296-314, 2016.
 72. Greenberger, R#, JF Mustard, **BL Ehlmann**, DL Blaney, EA Cloutis, JH Wilson, RO Green, AA Fraeman#, Imaging spectroscopy of geological samples and outcrops: novel insights from microns to meters, *GSA Today*, 25(12) doi: 10.1130/GSATG252A.1, 2015.
 71. Hu, R#, DM Kass, **BL Ehlmann**, Y Yung. Tracing the fate of carbonate and the atmospheric evolution of Mars, *Nature Communications*, doi: 10.1038/ncomms10003, 2015
 70. Borlina, C.S.*, **BL Ehlmann**, E. Kite. Modeling the Thermal and Physical Evolution of Mount Sharp's Sedimentary Rocks, Gale Crater, Mars: Implications for Diagenesis on the MSL Curiosity Rover Traverse. *J. Geophys. Res.*, doi: 10.1002/2015JE004799, 2015
 69. Edwards, CS# and **BL Ehlmann**. Carbon sequestration on Mars, *Geology*, doi:10.1130/G36983.1, 2015
 68. Johnson, SS. MG Chevrette, **BL Ehlmann**, KC Benison. Insights from the metagenome of an acid salt lake: the role of biology in an extreme depositional environment. *PLOS One*, DOI: 10.1371/journal.pone.0122869, 2015.
 67. Bristow, TF et al. (incl. **BL Ehlmann**), The origin and implications of clay minerals from Yellowknife Bay, Gale Crater, Mars, *Am. Mineralogist*, 100 (4). pp. 824-836, 2015.
 66. **Ehlmann, BL** and J.Buz. Mineralogy and Fluvial History of the Watersheds of Gale, Knobel, and Sharp craters: A Regional Context for MSL Curiosity's Exploration. *Geophys. Res. Lett.*, doi: 10.1002/2014GL062553, 2015.
 65. Watkins, JA, **BL Ehlmann**, A Yin. Long-runout landslides and the long-lasting effects of early water activity on Mars, *Geology*, doi:10.1130/G36215.1, 2015
 64. Pilorget, C#, J Fernando, **BL Ehlmann**, S Doute. Photometry of the particulate mixtures: what controls the phase curve?, *Icarus*, 250, 188-203, doi:10.1016/j.icarus.2014.11.036, 2015.
 63. Mangold, N., et al. (incl. **B Ehlmann**), Chemical variations in Yellowknife Bay formation sedimentary rocks analyzed by ChemCam on board the Curiosity rover on Mars. *J. Geophys. Res. Planets*, 120, 452–482. doi: 10.1002/2014JE004681, 2015.
 62. Melikechi, N. et al. ((incl. **B Ehlmann**), Correcting for variable laser-target distances of laser-induced breakdown spectroscopy measurements with ChemCam using emission lines of Martian dust spectra. *Spectrochimica Acta Part B: Atomic Spectroscopy*, 96. pp. 51-60, doi: org/10.1016/j.sab.2014.04.004, 2014
 61. **Ehlmann, B.** Beaty, D., Meyer M. Developing an Updated, Integrated Understanding of Mars. *Eos*, vol. 95(39), 30 Sept 2014 (conference report for The Eighth International Conference on Mars, Pasadena, CA, 14-18 July 2014).
 60. Nachon, M. et al. (incl. Ehlmann, B.) Calcium sulfate veins characterized by ChemCam/Curiosity at Gale crater, Mars. *Journal of Geophysical Research. Planets*, 119 (9). pp. 1991-2016, doi: 10.1002/2013JE004588, 2014
 59. O'Rourke, JG, AS Wolf, **BL Ehlmann**. Venus: Interpreting the spatial distribution of volcanically modified craters, *Geophys. Res. Lett.*, 41, 8252–8260, doi:10.1002/2014GL062121, 2014.
 58. Seelos, KD, FP Seelos, CE Viviano-Beck, SL Murchie, RE Arvidson, **BL Ehlmann**, AA Fraeman. Mineralogy of the MSL Curiosity Landing Site in Gale Crater as Observed by MRO/CRISM, *Geophys. Res. Lett.*, 41, 4880–4887, 2014
 57. Viviano-Beck CE, FP Seelos, SL Murchie, EG Kahn, KD Seelos, HW Taylor, K Taylor, **B.L. Ehlmann**, SM Wiseman, JF Mustard, MF Morgan. Revised CRISM Spectral Parameters and Summary Products Based on the Currently Detected Mineral Diversity on Mars, *J. Geophys. Res.*, 119, 1403–1431, doi:10.1002/2014JE004627, 2014
 56. Johnson, JR et al. (incl. **B Ehlmann**), ChemCam Passive Reflectance Spectroscopy of Surface Materials at the Curiosity Landing Site, Mars. *Icarus*, 10.1016/j.icarus.2014.02.028, 74-92, 2015

55. McCollom, TM, **BL Ehlmann**, A Wang, BM Hynek, B Moskowicz, TS Berquo. Detection of iron substitution in natroalunite-natrojarosite solid solutions and potential implications for Mars, *American Mineralogist*, 99, 948-964, doi: 10.2138/am.2014.4617, 2014.
54. Pan, L, **BL Ehlmann**. Phyllosilicate and hydrated silica detections in the knobby terrains of Acidalia Planitia, *Geophysical Research Letters*, 41, 1890-1898, doi:10.1002/2014GL059423, 2014.
53. Marlow, JJ, DE LaRowe, **BL Ehlmann**, JP Amend, VJ Orphan. The Potential for Biologically Catalyzed Anaerobic Methane Oxidation on Ancient Mars, *Astrobiology*, 14(4), 1-16, doi:10.1089/ast.2013.1078, 2014.
52. Van Gorp B, P Mouroulis, D Blaney, RO Green, **BL Ehlmann**, J Rodriguez. Ultra-compact Imaging Spectrometer (UCIS) for remote, in-situ, and microscopic planetary mineralogy, *Journal of Applied Remote Sensing*, 8(1), 084988, doi: 10.1117/1.JRS.8.084988, 2014
51. **Ehlmann, B.L.** and Edwards, C.S.#, Mineralogy of the Martian Surface. *Annual Reviews of Earth & Planetary Sciences*, 42; doi: 10.1146/annurev-earth-060313-055024, 2014.
50. Schmidt, M. et al., (incl. **B Ehlmann**) Geochemical diversity in first rocks examined by the Curiosity Rover in Gale Crater: Evidence for and significance of an alkali and volatile-rich igneous source. *J. Geophys. Res.*, 119, 64–81, doi:10.1002/2013JE004481, 2014.
49. Sautter, V, et al. (incl. **B Ehlmann**), Igneous mineralogy at Bradbury Rise: The first ChemCam campaign at Gale crater, *J. Geophys. Res. Planets*, 119, 30–46, doi:10.1002/2013JE004472, 2014.
48. Ming, DW et al. (incl. **B Ehlmann**). Volatile and Organic Compositions of Sedimentary Rocks in Yellowknife Bay, Gale Crater, Mars, *Science*, 343, 6169 2014
47. McLennan, SM et al. (incl. **B Ehlmann**). Elemental Geochemistry of Sedimentary Rocks in Yellowknife Bay, Gale Crater, *Science*, 343, 6169 2014
46. Vaniman, DT, et al (incl. **B Ehlmann**). Mineralogy of a mudstone on Mars., *Science*, 343, 6169 2014
45. Grotzinger, JP et al. (incl. **B Ehlmann**), A Habitable Fluvio-Lacustrine Environment a Yellowknife Bay, Gale Crater, Mars, *Science*, 343, 6169 2014
44. Pilorget, C#, CS Edwards#, **BL Ehlmann**, F Forget, E Millour. Material ejection by the cold jets and temperature evolution of the south seasonal polar cap of Mars from THEMIS/CRISM observations and implications for surface properties, *J. Geophys. Res.*, 118(12), 2520-2536
43. Meslin, P.-Y. et al. (incl. **B. Ehlmann**), Soil Diversity and Hydration as Observed by ChemCam at Gale Crater, Mars, *Science*, 341, 6153 2013.
42. Creveling, J.R., Knoll, A.H., Fernandez-Remolar, D., Bergmann, K.D., Gill, B.C., Garcia-Bellido, D.C., Menendez, S., Rodriguez-Martinez, M., **Ehlmann, B.L.**, Stack, K.M., Hallmann, C., Amils, R., Grotzinger, J.P., Abelson, J. Geobiology of a Lower Cambrian Carbonate Platform, Pedroche Formation, Spain, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 386: 459-478, 2013.
41. **Ehlmann, BL**, G Berger, N Mangold, JR Michalski, D Catling, SW Ruff, E Chassefiere, PB Niles, V Chevrier, F. Poulet, Geochemical Consequences of Widespread Clay Mineral Formation in Mars' Ancient Crust. *Space Science Reviews*, doi: 10.1007/s11214-012-9930-0, 2013.
40. Niles, PB, DC Catling, G Berger, E Chassefiere, **BL Ehlmann**, JR Michalski, R. Morris, SW Ruff, B. Sutter, Geochemistry of carbonates on Mars: implications for climate history and nature of aqueous environments. *Space Science Reviews*, doi: 10.1007/s11214-012-9940-y.
39. **Ehlmann, BL**, DL Bish, SW Ruff, JF Mustard. Mineralogy and chemistry of altered Icelandic basalts: application to clay mineral detection and understanding aqueous environments on Mars. *J. Geophys. Res.*, 117, E00J16, doi:10.1029/2012JE004156, 2012.
38. Meunier, A., S Petit, **BL Ehlmann**, P Dudoignon, F Westall, A Mas, A El Albani, E Ferrage. Magmatic precipitation as a possible origin of Noachian clays on Mars, *Nature Geoscience*, doi: 10.1038/ngeo1572, 2012.
37. Etioppe, G., **BL Ehlmann**, M. Schoell, Low temperature production and exhalation of methane from serpentinized rocks on Earth: A potential analog for methane production on Mars *Icarus*, doi: 10.1016/j.icarus.2012.05.009, 276-285, 2013.
36. **Ehlmann, BL** and JF Mustard. An in-situ record of major environmental transitions on early Mars at Northeast Syrtis Major, *Geophys. Res. Lett*, 39, L11202, doi:10.1029/2012GL051594, 2012.
35. Hu, R, **BL Ehlmann**, S Seager. Theoretical Spectra of Terrestrial Exoplanet Surfaces. *The Astrophysical Journal*, 752(7), doi:10.1088/0004-637X/752/1/7, 2012.
34. **Ehlmann, BL**, JF Mustard, SL Murchie, J-P Bibring, A Meunier, AA Fraeman, Y Langevin. Subsurface water and clay mineral formation during the early history of Mars. *Nature*, 479, 53-60, doi: 10.1038/nature10582, 2011.

33. **Ehlmann, BL**, JF Mustard, RN Clark, GA Swayze, SL Murchie. Evidence for low-grade metamorphism, diagenesis, and hydrothermal alteration on Mars from phyllosilicate mineral assemblages. *Clays & Clay Minerals*, 59(4), 359-377, 2011.
32. Wray, JJ, **Ehlmann, BL**. Geology of possible Martian methane source regions, *Planetary & Space Science*, 59, 196-202, 2011.
31. Wray, J.J., R. E. Milliken, C. M. Dundas, G. A. Swayze, J. C. Andrews-Hanna, A. M. Baldridge, M. Chojnacki, J. L. Bishop, **B. L. Ehlmann**, S. L. Murchie, R. N. Clark, F. P. Seelos, L. L. Tornabene, and S. W. Squyres. Columbus crater and other possible groundwater-fed paleolakes of Terra Sirenum, Mars. *J. Geophys. Res.*, 116, E01001, doi:10.1029/2010JE003694, 2011.
30. Skok, J.R., Mustard, J.F., **Ehlmann, B.L.**, Milliken, R.E., Murchie, S.L. Silica Deposits in the Nili Patera Caldera on the Syrtis Major Volcanic Complex, Mars. *Nature Geoscience*, 3, 838-841, 2010.
29. Viles, HA, **BL Ehlmann**, CF Wilson, T Cebula, M Bourke. Simulating physical weathering of basalt on Mars and Earth by thermal cycling, *Geophys. Res. Lett.*, 37, L18201, 2010.
28. **Ehlmann, BL**, JF Mustard, S.L. Murchie. Geologic setting of serpentine-bearing rocks on Mars. *Geophys. Res. Letters*, doi:10.1029/2010GL042596, 2010.
27. Skok, JR, JF Mustard, SL Murchie, MB Wyatt, **BL Ehlmann**. Spectrally distinct ejecta in Syrtis Major, Mars: Evidence for environmental change at the Hesperian-Amazonian boundary. *J. Geophys. Res.*, 115, E00D14, doi:10.1029/2009JE003338, 2010.
26. **Ehlmann, BL**. Diverse aqueous environments during Mars' first billion years: the emerging view from orbital visible-near infrared spectroscopy. *Geochemical News*, 142, 2010.
25. Mustard, JF, **BL Ehlmann**, F Poulet, N Mangold, JW Head, SL Murchie, J-P Bibring, LH Roach. Composition, Morphology, and Stratigraphy of Noachian Crust around the Isidis basin. *J. Geophys. Res.*, 114, E00D12, doi:10.1029/2009JE003349, 2009.
24. McKeown, N. K., J. L. Bishop, E. Z. Noe Dobrea, **B. L. Ehlmann**, M. Parente, J. F. Mustard, S. L. Murchie, G. A. Swayze, J. Bibring, and E. A. Silver. Characterization of phyllosilicates observed in the central Mawrth Vallis region, Mars, their potential formational processes, and implications for past climate, *J. Geophys. Res.*, 114, E00D10, doi:10.1029/2008JE003301, 2009.
23. **Ehlmann, BL**, JF Mustard, GA Swayze, RN Clark, JL Bishop, F Poulet, D Des Marais, LH Roach, RE Milliken, J Wray, O Barnouin-Jha SL Murchie. Identification of hydrated silicate minerals on Mars using MRO-CRISM: geologic context near Nili Fossae and implications for aqueous alteration, *J. Geophys. Res.*, E00D08, doi:10.1029/2009JE003339, 2009.
22. Murchie, SL, JF Mustard, **BL Ehlmann**, RE Milliken, JL Bishop, NK McKeown, EZ Noe Dobrea, FP Seelos, DL Buczkowski, SM Wiseman, RE Arvidson, JJ Wray, G Swayze, RN Clark, J-P Bibring, AS McEwen. A synthesis of Martian aqueous mineralogy after one Mars year of observations from the Mars Reconnaissance Orbiter. *J. Geophys. Res.*, doi:10.1029/2009JE003344, 2009.
21. **Ehlmann, BL**, JF Mustard, SL Murchie, F Poulet, JL Bishop, AJ Brown, WM Calvin, RN Clark, DJ Des Marais, RE Milliken, LH Roach, TL Roush, GA Swayze, JJ Wray. Orbital Identification of Carbonate-Bearing Rocks on Mars. *Science*, 322, 1828-1832, 2008
20. Milliken, RE, G Swayze, R Arvidson, J Bishop, R Clark, **B Ehlmann**, R Green, J Grotzinger, R Morris, S Murchie, J Mustard, C Weitz. Opaline silica in young deposits on Mars. *Geology*, 36(11), 847-850, 2008.
19. Bishop, JL, EZ Noe Dobrea, NK McKeown, M Parente, **BL Ehlmann**, JR Michalski, RE Milliken, F Poulet, GA Swayze, JF Mustard, SL Murchie, J-P Bibring. Phyllosilicate Diversity and Past Aqueous Activity Revealed at Mawrth Vallis, Mars, *Science* 321, 830-833, 2008.
18. Wray, J.J., **BL Ehlmann**, SW Squyres, JF Mustard, RL Kirk. Compositional Stratigraphy of Clay-Bearing Layered Deposits at Mawrth Vallis, Mars. *Geophysical Research Letters* 35, L12202, doi: 10.1029/2008GL034385, 2008.
17. Mustard JF, SL Murchie, SL, SM Pelkey, **BL Ehlmann**, RE Milliken, JA Grant, J-P Bibring, F Poulet, J Bishop, E Noe Dobrea, L Roach, F Seelos, RE Arvidson, S Wiseman, R Green, C Hash, D Humm, E Malaret, JA McGovern, K Seelos, T Clancy, R Clark, D Des Marais, N Izenberg, A Knudson, Y Langevin, T Martin, P McGuire, R Morris, M Robinson, T Roush, M Smith, G Swayze, H Taylor, T Titus, M Wolff. Hydrated Silicate Minerals on Mars Observed by the CRISM Instrument on MRO. *Nature* 454, 305-309, 2008.
16. Herkenhoff, KE and 44 others (including **B Ehlmann**) Surface processes recorded by rocks and soils on Meridiani Planum, Mars: Microscopic Imager observations during Opportunity's first three extended missions, *J. Geophys. Res.*, 113, E12S32, doi:10.1029/2008JE003100, 2008.

15. **Ehlmann, BL**, JF Mustard, CI Fassett, SC Schon, JW Head, DJ Des Marais, JA Grant, SL Murchie, CRISM team. Clay mineralogy and organic preservation potential of lacustrine sediments from a Martian delta environment, Jezero Crater, Nili Fossae, Mars. *Nature Geoscience*, 1, 355-358, 2008.
14. McGuire, PC and 24 others (including **B.L. Ehlmann**). MRO/CRISM Retrieval of Surface Lambert Albedos for Multispectral Mapping of Mars With DISORT-Based Radiative Transfer Modeling: Phase 1-Using Historical Climatology for Temperatures, Aerosol Optical Depths, and Atmospheric Pressures. *IEEE Transactions on Geoscience and Remote Sensing*, 46(12), 4020-4040, 2008.
13. **Ehlmann, BL**, HA Viles, and MC Bourke. Quantitative morphologic analysis of boulder shape and surface texture to infer environmental history: A case study of rock breakdown at the Ephrata Fan, Channeled Scabland, Washington. *J. Geophys. Res.*, 113, F02012, doi:10.1029/2007JF000872, 2008.
12. Herkenhoff, KE and 42 others (incl. **B.L. Ehlmann**) Overview of the Microscopic Imager Investigation during Spirit's first 450 sols in Gusev crater. *J. Geophys. Res.*, 111, E02S04, doi:10.1029/2005JE002574, 2006.
11. **Ehlmann, BL** and RE Criss. Enhanced stage and stage variability on the lower Missouri River benchmarked by Lewis and Clark. *Geology*, 34 (11), 977-980, doi:10.1130/G22754A.1, 2006
10. Arvidson, RE, F Poulet, RV Morris, J-P Bibring, JF Bell III, SW Squyres, PR Christensen, G Belluci, B Gondet, **BL Ehlmann**, WH Farrand, RL Fergason, M Golombek, JL Griffes, J Grotzinger, EA Guinness, KE Herkenhoff, JR Johnson, G Klingelhoefer, Y Langevin, D Ming, K Seelos, RJ Sullivan, JG Ward, SM Wiseman, M Wolff. Nature and Origin of the Hematite-Bearing Plains of Meridiani Based on Analyses of Orbital and Opportunity Data Sets, *JGR* 111(E12), E12S08, doi:10.1029/2006JE002728, 2006.
9. **Ehlmann, BL**, RE Arvidson, BL Jolliff, SS Johnson, B Ebel, N Lovenduski, JD Morris, JA Byres, NO Snider, RE Criss. Hydrologic and Isotopic Modeling of Alpine Lake Waiau, Mauna Kea, Hawaii. *Pacific Science* 59 (1), 1-15, 2005.
8. **Ehlmann, BL**, J Chowdhury, TC Marzullo, RE Collins, J Litzenberger, S Ibsen, WR Krauser, B DeKock, M Hannon, J Kinnevan, R Shepard, FD Grant. Humans to Mars: A Feasibility and Cost-Benefit Analysis. *Acta Astronautica* 56 (9-12), 851-858, 2005.
7. Golombek, MP, RE Arvidson, JF Bell III, PR Christensen, JA Crisp, LS Crumpler, **BL Ehlmann**, RL Fergason, JA Grant, R Greeley, AFC. Haldemann, DM Kass, TJ Parker, JT Schofield, SW Squyres, RW Zurek. Assessment of Mars Exploration Rover Landing Site Predictions and Implications for Climate Change. *Nature*, 436, 43-46, 2005.
6. Arvidson, RE, RC Anderson, P Bartlett, JF Bell III, PR Christensen, P Chu, K Davis, **BL Ehlmann**, MP Golombek, S Gorevan, EA Guinness, AFC. Haldemann, KE Herkenhoff, G Landis, R Li, R Lindemann, DW Ming, T Myrick, T Parker, L Richter, FP Seelos IV, LA Soderblom, SW Squyres, RJ Sullivan, J Wilson. Localization and Physical Properties Experiments Conducted by Opportunity at Meridiani Planum. *Science* 306, 1730-1733, 2004.
5. Arvidson, RE, RC Anderson, P Bartlett, JF Bell III, D Blaney, PR Christensen, P Chu, L Crumpler, K Davis, **BL Ehlmann**, R Fergason, MP Golombek, S Gorevan, JA. Grant, R Greeley, EA Guinness, AFC. Haldemann, KE Herkenhoff, J Johnson, G Landis, R Li, R Lindemann, H McSween, DW Ming, T Myrick, L Richter, FP Seelos IV, SW Squyres, R Sullivan, A Wang, J Wilson. Localization and physical properties experiments conducted by Spirit at Gusev crater. *Science* 305, 821-824, 2004.
4. Grant, JA, R Arvidson, JF Bell, III, NA Cabrol, MH Carr, P Christensen, L Crumpler, DJ Des Marais, **BL Ehlmann**, J Farmer, M Golombek, FD Grant, R Greeley, K Herkenhoff, R Li, HY McSween, DW Ming, J Moersch, JW Rice, Jr., S Ruff, L Richter, S Squyres, R Sullivan, C Weitz. Surficial Deposits at Gusev Crater Along Spirit Rover Traverses. *Science* 305, 807-810, 2004.
3. Herkenhoff, KE, SW Squyres, R Arvidson, DS Bass, JF Bell III, P Bertelsen, **BL Ehlmann**, W Farrand, L Gaddis, R Greeley, J Grotzinger, AG Hayes, SF Hviid, JR Johnson, B Jolliff, KM Kinch, AH Knoll, MB Madsen, JN Maki, SM McLennan, HY McSween, JW Rice, Jr., L Richter, M Sims, PH Smith, LA Soderblom, N Spanovich, R Sullivan, S Thompson, T Wdowiak, C Weitz, P Whelley. Evidence from Opportunity's Microscopic Imager for Ancient Water on Meridiani Planum. *Science* 306, 1727-1730, 2004.
2. Soderblom, LA, RC Anderson, RE Arvidson, JF Bell III, NA Cabrol, W Calvin, PR Christensen, BC Clark, T Economou, **BL Ehlmann**, WH Farrand, D Fike, R Gellert, TD Glotch, MP Golombek, R Greeley, JP Grotzinger, KE Herkenhoff, DJ Jerolmack, JR Johnson, B Jolliff, G Klingelhoefer, AH Knoll, ZA Learner, R Li, MC Malin, SM McLennan, HY McSween, DW Ming, RV Morris, JW Rice Jr., L Richter, R Rieder, D Rodionov, C Schröder, FP Seelos IV, JM Soderblom, SW Squyres, R

- Sullivan, WA Watters, CM Weitz, MB Wyatt, A Yen, J Zipfel. Soils of Eagle Crater and Meridiani Planum at the Opportunity Rover Landing Site. *Science* 306, 1723-1726, 2004.
1. Solar System Exploration Survey, National Academy of Sciences, Space Studies Board. (Brian Dewhurst, **Bethany Ehlmann**, and David Smith, text eds.), *New Frontiers in Solar System Exploration*. National Academies Press, 2003, 32pp.

INVITED LECTURES

- 2021 Lunar Surface Innovation Consortium
- 2020 American Museum of Natural History, New York; Keck Institute for Space Studies, Caltech; TechCrunch
- 2019 Goldschmidt Conference Plenary Speaker, Barcelona, Spain; Japanese winter school on Aquaplanetaology, Koyasan; Earth & Life Science Institute, Tokyo Tech; University of Texas; Astrobiology Science Conference Mars Plenary
- 2018 Massachusetts Institute of Technology; Earth and Life Sciences Institute, Tokyo Tech; University of California, Los Angeles; Arizona State University
- 2017 University of British Columbia, Harvard University, Max Planck Institute for Solar System Research, JHU Applied Physics Laboratory, NASA Night Sky Network
- 2016 AGU Union Public Outreach Event (featured panelist); IEEE WHISPERS (plenary speaker); Japan Society for the Promotion of Science (Washington, DC); Vatican Observatory Summer School; NASA Ames Summer Seminar Series (center-wide); JPL Mars seminar series
- 2015 Earth & Life Sciences Institute, Tokyo Tech; University of Toulouse, University of Utah, University of the Pacific, California State University, Chico; Mineralogical Society of Southern California; Kavli Symposium, Jerusalem
- 2014 University Massachusetts-Amherst; Southwest Research Institute; Silas Peirce Lecture, Boston University; McGill University; Lafayette College; Westchester University; California State University-Long Beach; Southwest Research Institute; Public event, National Geographic, Washington, DC; TED Youth, New York City
- 2013 Kongsberg Seminar, University of Oslo; University of Colorado; University of California, Santa Cruz; National Geographic Explorers Symposium, Washington, DC; Summer Science Program, Santa Barbara; LPL seminar, U. Arizona; Jackson School Geosciences, UT Austin
- 2012 National Geographic 50 Years of Robotic Solar System Exploration, Washington, DC; Division of Nuclear Physics Annual Meeting, Newport, CA; Earth & Space Sciences Colloquium, UCLA; NAI Astrobiology seminar (webcast), University of Washington; Department of Geology, SUNY-Stony Brook; Geological Sciences Department, University of Nevada, Reno
- 2011 Division of Geological & Planetary Sciences, Caltech; Department of Astronomy, Cornell University; Department of Geological Sciences, Brown University; Universite de Lyon, France; The Open University, UK; Universite Toulouse, France; UCLA Planetary Science Seminar
- 2010 D. Foster Hewitt Lecture Series, Lehigh University; Universitat Bern; Universite de Poitiers
- 2009 Washington University in St. Louis; Planetary Sciences Seminar, Caltech PS seminar; JPL; NASA Ames; Indiana University
- 2008 Planetary Sciences Institute
- 2007 NASA Ames Academy for Exploration
- 2005 Oxford University Space and Astronomical Society
- 2004 Macquarie University, Australian Centre for Astrobiology

PROFESSIONAL ASSOCIATIONS

- American Geophysical Union (since 2001), Fellow (since 2015)
- Geological Society of America (since 2003)
- Mineralogical Society of America (since 2009)
- Division of Planetary Sciences, AAAS (since 2012)
- British Society for Geomorphology (since 2005)
- Clay Minerals Society (since 2009)
- American Society for Photogrammetry and Remote Sensing (since 2014)

NASA Academy Alumni Association (since 2002; Executive Selection Board, 2005-9; Soffen Travel Grant Committee, 2006-9, 2011; Phone Interviewer, 2004, 2007, 2010, 2011)

ADDITIONAL SKILLS

Language: English (native), Spanish (advanced), French (intermediate)

TS clearance

NOLS Wilderness First Responder

PADI Advanced Open Water Diver

IYT Skipper International Certificate of Competence